In re Patent Application of:
CASSAGNES
Serial No. **10/039,233**
Filing Date: **December 31, 2001**
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REMARKS

The Applicant would like to thank the Examiner for the thorough examination of the present application, and for correctly indicating as allowable the subject matter of dependent Claims 17, 21, 28 and 34. Independent Claims 13, 23 and 30 have been amended to more clearly define the present invention over the cited prior art references. The claim amendments and arguments supporting patentability of the claims are presented below.

I. The Amended Claims

The present invention as recited in amended independent Claim 13 is directed to a decoding circuit for decoding a biphase signal having a pair of states. The decoding circuit comprises a precharging register for precharging the states of the biphase signal. One state of the pair of states is precharged at each pulse of a periodic precharging signal. A verification circuit compares the two states of the pair of states to detect an error and provides an error signal <u>when the two states are equal indicating that they have not been received accurately</u>.

Amended independent Claims 19 and 23 are directed to related circuits, and amended independent Claim 30 is directed to a related method. Each of these claims has been amended to recite that the error signal is provided <u>when the two states are equal indicating that they have not been received accurately</u>, similar to amended independent Claim 13.

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II.   The Claims Are Patentable

The Examiner rejected independent Claims 13, 19, 23 and
30 over the Hiramatsu patent. The Hiramatsu patent discloses a
circuit for decoding bi-phase BPSK signals. Bi-phase BPSK signals
are used in radio data systems (RDS) and radio broad-cast data
systems (RBDS). In RDS and RBS broadcasts, bi-phase BPSK signals
are used for the data. Bi-phase BPSK signals represent a "1" by
"10" and represent a "0" by "01", as shown in FIG. 1. The
Examiner has taken the position since the Hiramatsu patent
discloses in column 6, lines 3-6 that a detection signal is
provided based upon the detection, e.g., providing a detection
signal "1" if a3 and a4 are the same (column 6, lines 3-6), then
these two equal states constitute an error.

The Applicant submits that the Examiner has
mischaracterized the Hiramatsu patent. Referring to FIG. 5 of
Hiramatsu, the circuit includes a shift register **31** for storing
three successive states ai, ai+1, ai+2 (see col. 1, lines 62-63),
circuits **32-44** for comparing the state ai with ai+1 and the state
ai+1 with ai+2, and deducing states to be paired, i.e., (ai,
ai+1) or (ai+1, ai+2). A carrier extracting circuit **50** extracts
the bi-phase signal from the audio signal (see col. 5, lines 15-
20), and decoding circuitry (components **6-12**) decodes the bi-
phase signal (see col. 5, lines 22-36).

In particular, in Hiramatsu the circuit **3a** including
the elements **32-44** is a pair determining circuit (see col. 4,
lines 43-46), which is also referred to in the patent as a
"malfunction-preventing means." The first function of this

8

circuit is to determine which states are to be paired, i.e., a_i and a_{i+1} or a_{i+1} and a_{i+2}. If a_i and a_{i+1} are the same, and a_{i+1} and a_{i+2} differ from each other, then a_{i+1} and a_{i+2} are paired. If a_i and a_{i+1} differ from each other, and a_{i+1} and a_{i+2} are the same, then a_i and a_{i+1} are to be paired. This is due to the fact that the bi-phase signal represents "1" by "10" and "0" by "01."

A second function of this circuit is to detect an error, for example if the 3 states are "a_i,a_{i+1},a_{i+2}" = "010". In this case, a_i and a_{i+1} are different, and a_{i+1} and a_{i+2} are also different, so it is not possible to determine which states are to be paired. See, e.g., col. 6, lines 41-48, which is reproduced below for the Examiner's convenience:

> "Further, if 3 bits of data assumes "010" and the outputs from logic operation circuit **40** are X=0 and Y=0 by some cause, updown counter **41** neither counts up nor counts down. However, as long as the count value is larger than the prescribed threshold value $\alpha_1=1$ of the first comparator **42**, the circuit determines that there is error in the three bits of data, and continues to determine the pairs as (**a0**, **a1**), (**a2**, **a3**), (**a4**, **a5**) ... , similar to the aforementioned example." (Emphasis added).

Thus, in the circuit of Hiramatsu, two comparisons are necessary to detect an eventual error, namely a_i with a_{i+1} and a_{i+1} with a_{i+2}. An error signal is provided only if it is not possible to determine which states should be paired, i.e., if a_i does not equal a_{i+1} and a_{i+1} does not equal a_{i+2}. The Hiramatsu patent thus fails to disclose that the error signal is generated

9

when two states are equal indicating that they have not been received correctly. Instead, the Hiramatsu patent discloses a pair determining circuit based on receiving 3 states ai, ai+1 and ai+2, for example. In other words, the Hiramatsu patent determines which states are to be paired. As noted above, if the states cannot be paired, the updown counter **41** neither counts up nor counts down. However, as long as the count value is <u>larger</u> <u>than the prescribed threshold value</u> $\alpha1=1$ <u>of the first comparator</u> **42**, the circuit determines that there is error in the three bits of data, and continues to determine the pairs as (**a0**, **a1**), (**a2**, **a3**), (**a4**, **a5**) … .

In sharp contrast, amended independent Claim 13 recites that an error signal is provided <u>when the two states are equal</u> <u>indicating that they have not been received accurately</u>. This is not based on a prescribed threshold as in the Hiramatsu patent. Therefore, not only does Hiramatsu not teach all of the recitations of the above-noted claims, it teaches away from the claimed combination.

Accordingly, it is submitted that amended independent Claim 13 is patentable over the Hiramatsu patent. Amended independent Claims 19, 23 and 30 are similar to amended independent Claim 13. Therefore, it is submitted that these claims are also patentable over the Hiramatsu patent.

In view of the patentability of independent Claims 13, 19, 23 and 30, it is submitted that the dependent claims, which include yet further distinguishing features of the invention are also patentable. These dependent claims need no further
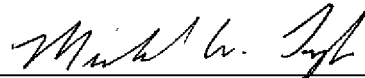
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discussion herein.

III. Conclusion

In view of the amendments to the claims and the arguments presented above, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

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